



## Technical characteristics of PalmElit-CIRAD®

# #F #I #S DExLM

variety in different growing conditions

## PalmElit has been distributing PalmElit-CIRAD® #F #I #S DExLM germinated seeds for many years in Africa.

The variety distributed is hardy and there is ample evidence that it is well suited to different African environments.

In addition, PalmElit always selects the most efficient planting material to best value the fertilization provided. The optimal yield will be obtained with reasoned fertilization (Cf: PalmElit Oil Palm Grower's Handbook).

	<b>Tenera Deli x La Mé PalmElit-CIRAD® #F #I #S DExLM</b>		
	<b>Average data in sandy soils*<sup>1</sup> (Planting density: 143 palms/Ha)</b>		
	<b>No water deficit</b>	<b>Water deficit ~200 mm/ years</b>	<b>Water deficit ~400 mm/ years</b>
<i>Tenera</i> Hybrid	Yes	Yes	Yes
Resistance to Fusarium wilt (#F)	High resistance* <sup>2</sup>	High resistance* <sup>2</sup>	High resistance* <sup>2</sup>
Low Lipase , reduced oil acidity (#I)	Yes	Yes	Yes
Average yearly height increment in cm (#S)	46-50 cm	44-48 cm	42-46 cm
Drought Tolerance	Tolerant	Tolerant	Tolerant
Bunch production (FFB) in adult age (> 7 years'old) in t/ha/year real conditions	30-32 t	25-27 t	18-20 t
Bunch production (FFB) in adult age* <sup>3</sup> (> 7 years'old) in t/ha/year (genetic trials)	31,5-33,6 t	26,2-28,3 t	18,9-21 t
Average bunch weight in adult age	< 18 kg	< 18 kg	< 18 kg
Oil mill extraction rate (CPO OER)	> 26 %	> 25 %	> 24 %
Oil laboratory extraction rate (CPO O/B)* <sup>3</sup>	~30 %	~29 %	~28 %
Oil mill extraction rate (PKO)	2-3 %	2-3 %	2-3 %
Oil laboratory extraction rate (PKO)* <sup>3</sup>	2,5-3,5%	2,5-3,5%	2,5-3,5%
Effective oil production (CPO) en t/ha/year	7,8-8,5 t	6,2-6,8 t	4,3-4,7 t
Total oil production (CPO + PKO) in t/ha/year	> 8,4 t	> 6,7 t	> 4,6 t
Iodine value (Wjis)	> 54	> 54	> 54
First harvest	2 years	2,5 years	3 years

\*<sup>1</sup> One must understand that the genetic performance of any oil palm planting material is impacted by crop management and environmental conditions: type of soils, climatic conditions. The most relevant is the water deficit (drought). We give our results for average sandy soils where our variety can yield 31 tons, but in excellent conditions, the yield can be 45 tons.

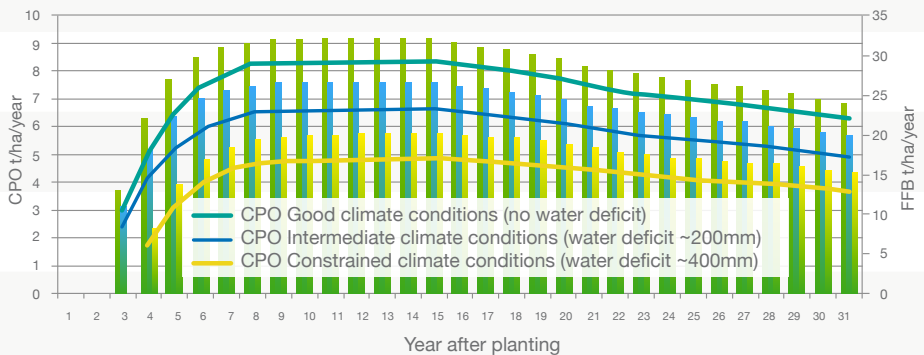
\*<sup>2</sup> PalmElit adopted the classification established by the international federation of seed companies (FIS) which graduates biotic resistance in different levels, according to the behavior of the variety in the face of attacks by a parasite or a specific pathogen: high resistance, intermediate resistance , sensitivity, immunity. The term tolerance is reserved for abiotic factors.

## FFB & CPO yield estimations according the water deficit

PalmElit – CIRAD® seeds embody 80 years of genetic improvement work undertaken by IRHO, CIRAD and PalmElit in conjunction with partners of excellence located on each of the continents where oil palm is grown.

The progress made in oil yields, measured scientifically, amounted to +60% between 1960 and 2010. It is still continuing today at a sustained rate.

FFB & CPO Yield - PalmElit-CIRAD® #F #I #S DEXLM



We have observed the true potential of CIRAD® varieties in our trials in Indonesia, North Sumatera, under good climate (rainfall and sunlight) conditions, with sandy soils.

It is represented by the green curve (CPO) and bars (FFB) in the following graphic which are field data.

As an indication we have estimated production with 200 mm (blue curve) and 400 mm (yellow curve) of water deficit, based on results from a network of plantations using CIRAD® varieties.

← <https://www.worldseed.org/our-work/plant-health/overview/>

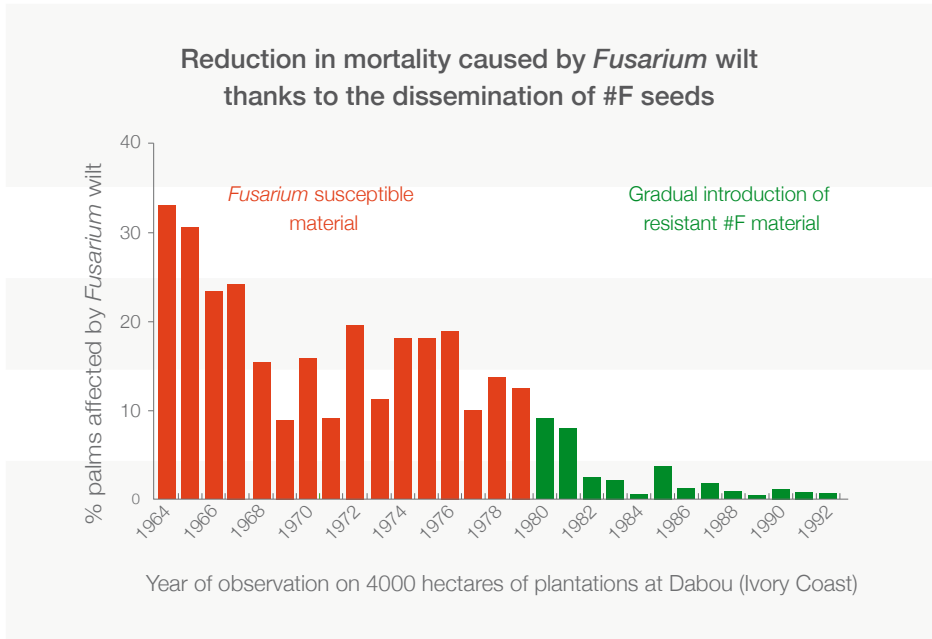
<sup>3</sup> The oil extraction rate can be given in laboratory data (oil to bunch) or estimated in the mill (OER, oil extraction rate) there is a 15% difference between the two forms. FFB also can be estimated in genetic trials or estimated in the real estate conditions (5% difference). The total performance differences between results estimated in laboratory and genetic trials and estimated in the mill and in the plantation is around 20%.

## High resistance to *Fusarium* wilt

#F is an option of oil palm protection against *Fusarium* wilt.

Today, the resistance of our best parents is assessed in large-scale screening tests in the prenursery. In the 1960s, yields at the Dabou estate (4,000 ha, Ivory Coast) were considerably reduced by *Fusarium* wilt which affected 35 to 40% of the oil palms.

Selection based on early screening helped to reduce losses to 10-15% as early as the 1970s, then gradually to less than 3%. Since the 1990s, the remission rate has been close to 100%.



## Low Lipase, reduced oil acidity

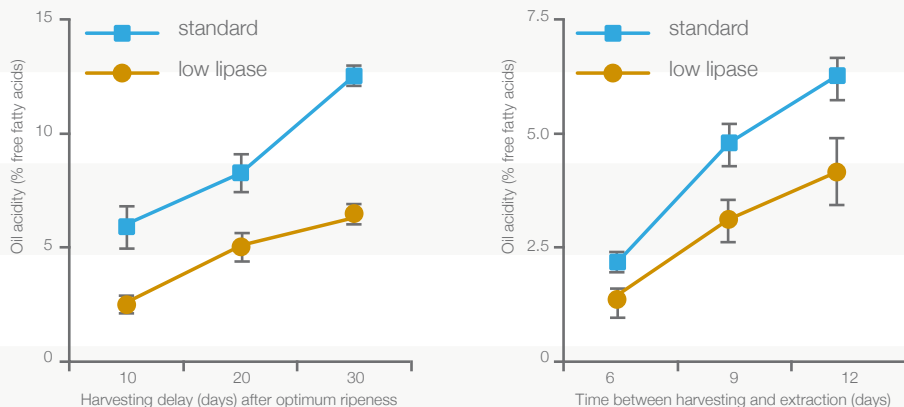
#I is an option that helps to protect oil from rapid acidification through the inactivation of endogenous lipase type enzymes.

Our research work has shown that the advantage of the “Low Lipase” option is decisive when harvesting and milling times fall outside the norms. In terms of harvesting, with conventional planting material the 5% acidity limit is reached if harvesting takes place around ten days after the normal date, whereas that limit is only reached after a delay of 20 days with the “Low Lipase” material.

In terms of extraction, the 5% acidity rate is reached after 7 to 10 days of FFB storage before sterilization with conventional planting material, while it remains under 3% for the “Low Lipase” material.

“Low Lipase” option therefore also offers an advantage when operating conditions are optimum (harvesting and milling on the same day) as in this case it leads to gains of up to 0.5% acidity.

### Reduced oil acidity thanks to “Low Lipase” planting material



Adapted from: Morcillo, F. et al. Improving palm oil quality through identification and mapping of the lipase gene causing oil deterioration. Nat. Commun. 4:2160 doi: 10.1038/ncomms3160 (2013)

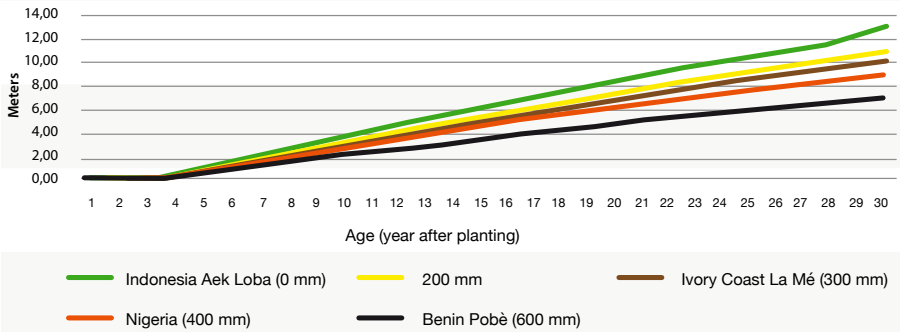
### «Short», for better plantation sustainability

#S is an option of reduced vertical stipe growth, which helps to extend the working life of the plantation and makes FFB harvesting easier.

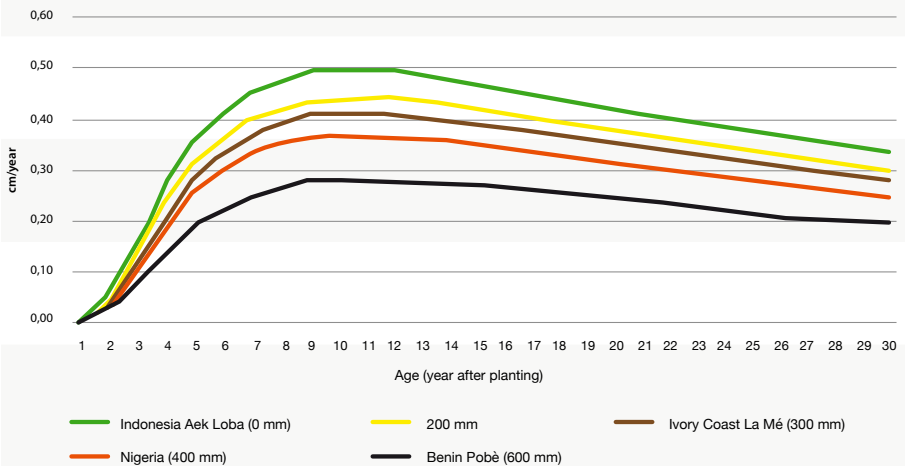
A slower vertical growth rate has been an intangible breeding target for PalmElit and its predecessors IRHO and CIRAD for 60 years. Our #S material embodies the success of this lengthy work.

The growth curves according the water deficit, given below, are indicative and the data may vary depending on climatic factors, characteristics of the soil and crop management

## Vertical growth by age (stem height in meter) in different environments and water deficit PalmElit-Cirad® #F #I #S DExLM



## Stem vertical growth in cm/year in different environments and water deficit PalmElit-Cirad® #F #I #S DExLM



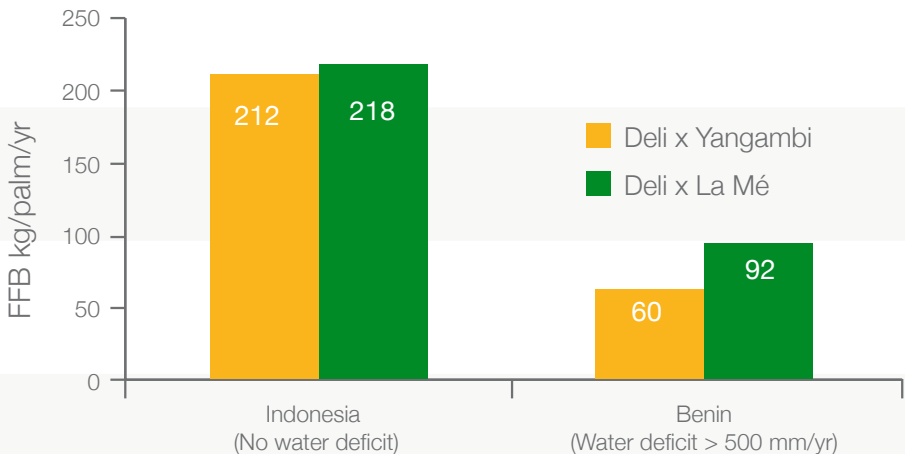
## Drought tolerance

PalmElit-Cirad® Deli x La Mé planting material produces a large number of bunches.

This specific trait enables to maintain good production even in stress conditions such as drought.

When compared with Deli x Yangambi, PalmElit-Cirad® Deli x La Mé produces 53% more with 550mm water deficit.

**FFB Yield**  
Comparison of Deli x Yangambi and Deli x La Mé materials under different water deficit conditions



## Country of seeds origin: Benin Republic

All PalmElit-CIRAD® seeds are produced under the scientific and technical supervision of PalmElit who guarantees the quality of seeds produced in Benin and distributed under the CIRAD® brand.

Our stringent procedures guarantee growers 99.9% of tenera palms after proper culling in the prenursery and nursery.

If oil palm growers follow our instructions, under normal conditions, the percentage of recovery and seedlings development in prenursery must be around 100%.

Oil composition	Indicative values
% carotene	0,077
Iodine value	55,3
% saturated fatty acids	47,4
% unsaturated fatty acids	52,6
% C14: 0 myristic acid	0,7
% C16: 0 palmitic acid	39,9
% C18: 0 stearic acid	6,7
% C18: 1 oleic acid	41,2
% C18: 2 linoleic acid	11,4

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